

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:
YUDOVSKY, et al.

Serial No.: 10/614,992

Confirmation No.: 8160

Filed: July 7, 2003

For: SELF ALIGNING NON
CONTACT SHADOW RING
PROCESS KIT

Group Art Unit: 1763

Examiner: Sylvia MacArthur

MAIL STOP APPEAL BRIEF-PATENTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

REPLY BRIEF

Applicants submit this Reply Brief to the Board of Patent Appeals and Interferences in response to the Examiner's Answer dated November 22, 2006. Please charge any additional fees that may be required to make this Reply Brief timely and acceptable to Deposit Account No. 20-0782/APPM/004191.C1/KMT.

ARGUMENTS

A. Rejection of claims 3-6, 8-14, and 17-25 under 35 U.S.C. 102(b) as being anticipated by *Cheng, et al.* (EP 0553691).

Claims 3-6, 8-14 and 17-25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Cheng, et al.* The Examiner states that *Cheng, et al.* teaches a shield ring 50 as a first edge ring and a support means 70 as a second edge ring because both of them are ring-shaped and are in mating relationship with one another due to the recesses of the shield ring 50 and the support means 70.

Applicants respectfully submit that *Cheng et al.* discloses a deposition chamber 2 containing a susceptor 40 (substrate support) supporting a wafer 10, a shield ring 50, and a shield support means 70. When processing the wafer 10 inside the deposition chamber 2 during a deposition stage (see, Figure 6 of *Cheng, et al.*), the shield ring 50 can be considered an edge ring because the shield ring 50 is located near the edge of the wafer 10, engaged by the wafer 10, provided to prevent edge deposition near the edge of the wafer 10, and raised higher in position away from the support of the support means 70.

During a non-deposition stage (see, Figure 2 of *Cheng, et al.*), the wafer 10 is lowered down in position and the support means 70 of *Cheng, et al.* is provided to support the shield ring 50 by resting the lowered shield ring 50 onto the support mean 70, which in turn is securing to the chamber body of the chamber 2. Despite the Examiner's statement that the claims do not exclude edge rings in mating relationship in the horizontal direction or a direction parallel to the support surface 40, the support means 70 is only a support means for supporting the shield ring 50. The support means 70 is not located near the edge of the wafer 10 and does not provide any vertical or horizontal structural interaction or function with the edge of the wafer 10. Accordingly, the support means 70 of *Cheng, et al.* is not an edge ring because, in a normal non-deposition position, the support means 70 is separated away from the edge of the wafer 10 by the shield ring 50; whereas in a deposition position, the support means 70 stays secured to the walls in place and is away from the movable

shield ring 50 and thus further away from the edge of the wafer 10. (See, column 4, lines 20-33.)

Accordingly, the support means 70 of *Cheng et al.* is secured to the walls of the chamber 2 with no vertical or horizontal structural interaction or function with the edge of the wafer 10 and is not an edge ring. In addition, the support means 70 is substantially separated away from the edge of the wafer 10 by the multiple shield rings, 102, 104, 105 as shown in Figure 8; the support means 70 is not an edge ring. (See, column 10, lines 20-32.) Therefore, the shield ring 50 is an edge ring but the support means 70 of *Cheng, et al.* is not an edge ring. *Cheng et al.* does not teach, show or suggest a second edge ring, as recited in claims 3-6, 8-14, and 17-25.

Accordingly, *Cheng et al.* does not teach, show or suggest a substrate support, a first edge ring disposed on the substrate support, the first edge ring having one or more tapered recesses, and a second edge ring having one or more matching tapered pins for mating engagement with the one or more tapered recesses of the first edge ring, as recited in claims 3-6, 8-14, and 17-25. Withdrawal of the rejection is respectfully requested.

B. Rejection of claims 3-6, 8-14 and 17-25 under 35 U.S.C. 102(b) as being anticipated by *Koai, et al.* (US 6,159,299).

Claims 3-6, 8-14 and 17-25 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *Koai, et al.* The Examiner states that *Koai et al.* teaches an edge ring 200 screwed to an outer portion 284 of a second edge ring 280 via centering bolts 271 and the edge ring 200 is rested upon spacing pin 272 which are screwed into the outer portion 284 of the second edge ring 280.

Applicants respectfully submit that *Koai et al.* discloses a substrate support 150, a purge ring 280, and an edge ring assembly 200. The purge ring 280, and an edge ring assembly 200 are constructed to structurally secured together and function together for a dual-purge flow pattern to be established. (See, Abstract, column 5, lines 1-10 and lines 21-30.) The purge ring 280 is an edge ring and the edge ring assembly 200 is an edge ring assembly provided for assisting the edge ring/purge ring 280 and, as such, the edge ring 280 is secured and screwed together to function

together as an integral structure having an edge ring and its own edge ring assembly. Since they are fastened together, there is no engagement or any mating engagement between the edge ring 280 and the edge ring assembly 200.

As described in *Koal et al.*, the edge ring assembly 200 is provided near an outer edge of the purge ring 280 and is secured to the purge ring 280 for assisting the purge ring 280 such that a channel 226 can be formed between the purge ring 280 and the edge ring assembly 200 for directing a second purge gas flow 292 therein. The edge ring assembly 200 having rings 220, 230, and 240 is an assembly secured to the edge ring 280 to assist the edge ring 280. Therefore, *Koal et al.* discloses a first edge ring and a first edge ring assembly attached to assist the first edge ring. *Koal et al.* does not teach, show or suggest a second edge ring for mating engagement with a first edge ring.

As also described in *Koal et al.*, three rings 240, 230, 220 of the ring assembly 200 are bolted together by three centering bolts 271 and are secured to an outer perimeter 280P2 of the purge ring 280 by fastening the three centering bolts 271 with three slots 288 of the purge ring 280. As a result, the ring assembly 200 can rest upon three spacing pins 272 which are screwed into the outer portion 284 of the purge ring 280 as part of the purge ring 280 and the channel 226 can form therebetween for flowing purge gas therein. (See, column 5, lines 64-67 and column 6, lines 1-46.) Therefore, the three centering bolts 271 of *Koal et al.* are provided to bolt three rings together and to secure/fasten the ring assembly 200 to the purge ring 280, and do not provide mating engagement with an second edge ring.

Moreover, *Koal et al.* does not teach, show, or suggest matching tapered pins and tapered recesses. The slots 288 of *Koal et al.* on the purge ring 280 for inserting with the centering bolts 271 on the edge ring assembly 200 are not tapered. (See, Figures 2A-2C.) In addition, a bolt ordinarily means an object in a cylinder shape like a bar, a rod, or a screw, not tapered in shape. Accordingly, *Koal et al.* does not teach, show or suggest a substrate support, a first edge ring disposed on the substrate support, the first edge ring having one or more tapered recesses, and a second edge ring having one or more matching tapered pins for mating engagement with the one or

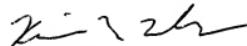
more tapered recesses of the first edge ring, as recited in claims 3-6, 8-14, and 17-25.
Withdrawal of the rejection is respectfully requested.

CONCLUSION

The Examiner errs in finding that *Cheng et al.* discloses two edge rings to reject claims 3-6, 8-14, and 17-25 because *Cheng et al.* does not teach, show, or suggest a second edge ring.

The Examiner errs in finding that *Koal et al.* discloses two edge rings with matching tapered pins and tapered recesses to reject claims 3-6, 8-14, and 17-25 because *Koal et al.* does not teach, show, or suggest tapered pins and tapered recesses for mating engagement two edge rings.

Respectfully submitted,



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